CLAIMS

WHAT IS CLAIMED IS:

1. A method of calibrating a device having a first fluid source that ejects a first drop quantity and a second fluid source that ejects a second drop quantity, comprising:

printing a pattern having a first portion and a second portion, wherein the first portion is printed by the first fluid source and the second portion is printed by the second fluid source;

obtaining a relationship between the first drop quantity and the second drop quantity from the pattern; and

adjusting data used to determine quantities of fluid to eject from the first fluid source or the second fluid source based on the relationship between the first drop quantity and the second drop quantity.

2. The method of claim 1, further comprising: determining whether a ratio between the first drop quantity and the second drop quantity deviates from a specified ratio.

3. The method of claim 1, further comprising: scanning the pattern to obtain a signal response, wherein the obtaining act obtains the relationship between the first drop quantity and the second drop quantity based on the signal response.

4. The method of claim 3, wherein the signal response includes a first portion response and a second portion response, and wherein the obtaining act obtains the relationship by comparing the first portion response with the second portion response.

5. The method of claim 4, wherein the obtaining act comprises:

determining an intersection point between a calculated value of the first portion response and the second portion response; and

determining the fill density of the first portion at the intersection point.

6. The method of claim 5, further comprising:

creating a fit line along at least a part of the signal response of the test portion; and

adjusting the intersection point to an intersection between the fit line and the calculated value of the reference portion response.

7. The method of claim 4, wherein the first portion has a fixed fill density and the second portion has a varying fill density.

8. The method of claim 7, wherein the obtaining act comprises:

determining a fill density of the second portion corresponding to a fill density of the first portion; and

calculating the second drop quantity from the fill density of the second portion.

9. The method of claim 7, wherein the second portion includes a plurality of tiles, each tile having a different fill density, and wherein the act of determining a fill density of the second portion includes locating the tile having the fill density corresponding to the fill density of the first portion.

10. The method of claim 1, wherein the pattern further comprises at least one selected from the group consisting of a spit bar and a light absorbing portion.

11. A method comprising:

printing a test pattern having a reference portion and a test portion, wherein the reference portion is printed by a first fluid source and the test portion is printed by a second fluid source;

obtaining a relationship between a first drop volume of the first fluid source and a second drop volume of the second fluid source from the test pattern; and

adjusting at least one value in a color map using the relationship between the first drop volume and the second drop volume.

12. The method of claim 11, further comprising: scanning the test pattern to obtain data, wherein the obtaining act obtains the relationship between the first drop volume and the second drop volume from the test pattern based on the data.

13. The method of claim 12, wherein the data includes reference portion data and test portion data, and wherein the obtaining act obtains the relationship by comparing the reference portion data with the test portion data.

14. The method of claim 13, wherein the obtaining act comprises:

determining an intersection point between a reference line determined from the reference portion data and the test portion data; and

determining the fill density of the test portion at the intersection point.

15. The method of claim 14, wherein the test line is fit to at least a part of the test portion data; and determining the intersection point includes determining an intersection between the fit line and the reference line.

16. The method of claim 13, wherein the reference portion has a fixed fill density and the test portion has a varying fill density.

17. The method of claim 16, wherein the obtaining act comprises:

determining a fill density of the test portion substantially equal to a fill density of the reference portion; and

calculating the second drop volume from the fill density of the test portion.

18. The method of claim 16, wherein the test portion is divided into a plurality of test tiles, each test tile having a different fill density, and wherein determining the fill density of the test portion includes determining the test tile having the fill density substantially equal to the fill density of the reference portion.

19. The method of claim 11, wherein the test pattern further comprises at least one selected from the group consisting of a spit bar and a light absorbing portion.

20. A calibration apparatus for a device having a first fluid source to eject a first drop quantity to form a first region and a second fluid source to eject a second drop quantity to form a second region, comprising:

an optical sensor to generate output from scanning the first region and the second region; and

a processor arranged to receive the output, wherein the processor includes a configuration to determine a relationship between the first drop quantity and the second drop quantity using the output.

21. The calibration apparatus of claim 20, wherein the optical sensor includes a light source to at least partially illuminate the pattern.

22. The calibration apparatus of claim 20, wherein the processor includes a configuration to change data specifying quantities of fluid to eject from the first fluid source or the second fluid source based upon the relationship.

23. The calibration apparatus of claim 20, wherein the processor includes a configuration to determine whether a ratio between the first drop quantity and the second drop quantity deviates from a specified ratio.

24. The calibration apparatus of claim 20, wherein the output includes a first response corresponding to the first region and a second response corresponding to the second region, and wherein the processor includes a configuration to obtain the relationship by comparing the first response with the second response.

25. The calibration apparatus of claim 24, wherein the processor includes a configuration to determine an intersection point between a first value determined from the first response and a second value determined from the second response and to determine the fill density of the second region at the intersection point.

26. The calibration apparatus of claim 24, wherein the processor includes a configuration to determine a fit line using at least a part of the second response to determine an intersection point at an intersection between the fit line and a line corresponding to a calculated value of the first response and to determine the fill density of the second region.

27. The calibration apparatus of claim 24, wherein the first region has a fixed fill density and the second region has a varying fill density.

28. The calibration apparatus of claim 24, wherein the processor includes a configuration to determine a fill density of the second region corresponding to a fill density of the first region and calculates the second drop quantity from the fill density of the second region.

29. The calibration apparatus of claim 28, wherein the second region is divided into a plurality of tiles, each tile having a different fill density, and wherein the processor includes a configuration to determine a fill density of the second region by locating the tile having the fill density corresponding to the fill density of the reference portion.

30. A calibration apparatus for a device having a first fluid source that ejects a first drop volume and a second fluid source that ejects a second drop volume, comprising:

means for scanning a test pattern having a reference portion and a test portion and generating a sensor output, wherein the reference portion is printed by the first fluid source and the test portion is printed by the second fluid source;

means for obtaining a relationship between the first drop volume and the second drop volume from the test pattern; and

means for changing a color map using the relationship.

31. The calibration apparatus of claim 30, wherein the scanning means includes means for illuminating the test pattern.

32. The calibration apparatus of claim 30, further comprising:

means for determining a fill density of the test portion corresponding to a fill density of the reference portion; and

means for calculating a drop volume from the fill density of the test portion.

33. An imaging system, comprising:

at least a first fluid source and a second fluid source that eject fluid onto a print medium to form an image, the first fluid source for ejecting a first drop volume and the second fluid source for ejecting a second drop volume;

an optical sensor that scans a test pattern having a reference portion and a test portion and generates a sensor output, wherein the reference portion is printed by the first fluid source and the test portion is printed by the second fluid source; and

a processor coupled to the optical sensor to receive the sensor output, wherein the processor includes a configuration to obtain a relationship between the first drop volume and the second drop volume from the test pattern and a configuration to adjust at least one value in a color map.

34. The imaging system of claim 33, wherein the processor includes a configuration to determine whether a ratio between the first drop volume and the second drop volume deviates from a specified ratio.

35. The imaging system of claim 33, wherein the sensor output includes a reference portion response and a test portion response, and wherein the processor includes a configuration to obtain the relationship by comparing the reference portion response with the test portion response.

36. The imaging system of claim 35, wherein processor includes a configuration to determine an intersection point between the reference portion response and the test portion response and to determine the fill density of the test portion at the intersection point.

37. The imaging system of claim 36, wherein the processor includes a configuration to determine a fit line along at least a part of the signal response of the test portion and adjusts the intersection point to be the intersection between the fit line and the calculated signal response of the reference portion.

38. The imaging system of claim 33, wherein the processor includes a configuration to determine a fill density of the test portion corresponding to a fill density of the reference portion and calculates the second drop volume from the fill density of the test portion.

39. The imaging system of claim 38, wherein the test portion is divided into a plurality of test tiles, each test tile having a different fill density, and wherein the processor determines a fill density of the test portion by locating the test tile having the fill density corresponding to the fill density of the reference portion.

40. The imaging system of claim 33, wherein the first fluid source is a high dye-load pen and the second fluid source is a low dye-load pen.

41. The imaging system of claim 33, wherein the first fluid source and the second fluid source are pens in a multiple-pen printhead.

42. The imaging system of claim 33, wherein the system is selected from the group consisting of a printer, a copier, a fax machine, and an all-in-one imaging device.